

cribed to the ocelli of adult insects (in addition to the function of distinguishing objects close at hand)—and if the ocelli of these nymphs are wholly functionless, the fact should be brought out by experiment before it is stated as though it had been conclusively proven.

Dr. MacGillivray's statement that "Ocelli are never present in ametabolous insects" appears to be entirely too sweeping. All of the insects belonging to the ametabolous group Machiloidea (which is considered as an order by many entomologists) appear to have exceptionally large and well developed ocelli. In fact, the ocelli of these insects are proportionately much larger than those of any other insects I know of, so that Dr. MacGillivray's statement in this matter can be accepted only with reservations.\*

In calling attention to these exceptions to the general statements made in Dr. MacGillivray's paper, I would not minimize the value of the principal points brought out in his article, since in the main these points are quite correct, and are well taken. On the other hand, the exceptions to his general statements are in some cases of sufficient importance to merit mention, and should therefore be called to the attention of students who are referred to Dr. MacGillivray's paper in their general reading, or of anyone who contemplates making a much-needed study of the different types of eyes found among insects.

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## The known Membracidae of Ecuador (Homop.)

By DR. FREDERICK W. GODING, Guayaquil, Ecuador.

(Continued from page 136)

\***Triquetra inermis** Fairm. Rev. Mem. p. 280. *Hab.*: Province of El Oriente, (Goodfellow); Macas, Province of Chimborazo, (Feyer).

\***Triquetra obtusa** Fowl. Tr. Ent. Soc. Lond. (1894), p. 417. *Hab.*: Province of El Oriente, (Goodfellow).

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\* In many ametabolous insects, as Dr. MacGillivray points out, simple eyes occur in the position which compound eyes occupy when present in higher insects. In the ametabolous group Machiloidea, however, there are well-developed compound eyes of the normal type, and in addition to these, the Machiloidea have three ocelli located on the frontal region as in higher insects.

\**Triquetra grossa* Fairm. Rev. Mem. p. 280. *Hab.*: Province of El Oriente, (Goodfellow).

\**Triquetra virgata* Fairm. Rev. Mem. p. 282. *Hab.*: Normandie, Province of El Oriente, (Feyer).

\**Triquetra angustata* Fairm. Rev. Mem. p. 282. *Hab.*: Normandie, Province of El Oriente, (Feyer).

\**Triquetra ustulata* Fairm. Rev. Mem. p. 281. *Hab.*: Normandie, Province of El Oriente, (Feyer).

\**Umbonia erecta* n. sp. (See description on another page.) *Hab.*: Mangorisa River, Province of El Oriente, (Feyer).

\**Umbonia ataliba* Fairm. Rev. Mem. p. 278. *Hab.*: Canelas, Puyo, Province of El Oriente, (Feyer).

\**Umbonia spinosa* Fabr. Syst. Ent. p. 675. *Hab.*: Machala, Province of El Oro, (Rorer); Normandie, Province of El Oriente, (Feyer).

\**Hoplophora gigantea* Fairm. Rev. Mem. p. 269. *Hab.*: Province of El Oriente, (Goodfellow).

\**Hoplophora vicina* Fairm. Rev. Mem. p. 270. *Hab.*: Quito, Province of Pichincha, (Walker); Cuenca, Province of Azuay, (Pachano); Province of El Oriente, (Goodfellow).

#### MEMBRACINAE.

\**Membracis jessica* n. sp. (See description on another page.) *Hab.*: Canelas, Province of El Oriente; Lliquino, Province of Tungurahua; Yaruquies, Province of Chimborazo, (Feyer).

\**Membracis mexicana* Guer. Icon. Reg. Anim. p. 364, pl. 59, f. 1. *Hab.*: Machala, Province of El Oro., (Rorer).

\**Membracis tectigera* Oliv. Enc. Meth. vii, p. 668. *Hab.*: Mangorisa River, Canelas, Province of El Oriente, (Feyer).

\**Enchenopa ignidorsum* Walk. List Hom. Brit. Mus., Suppl. p. 124. *Hab.*: Machala, Province of El Oro, (Rorer).

\**Sphongophorus ballista* Germ. Silb. Rev. Ent. iii, p. 231. *Hab.*: Quevedo, Province of Los Rios, (Campos).

\**Bolbonota pictipennis* Fairm. Rev. Mem. p. 258. *Hab.*: Machala, Province of El Oro, (Rorer).

\**Guayaquila roreriana* n. sp. and gen. (See description on another page.) *Hab.*: Machala, Province of El Oro, (Rorer).

#### DESCRIPTIONS OF NEW ECUADORIAN MEMBRACIDAE.

##### *Centrogonia flavo-limbata* n. sp.

Black, roughly punctured, furnished with numerous strong black hairs. Head black, with two short vertical lines above middle, a longer line reaching apex, a small dot near each eye, lateral borders and a dot on each side of apex bright yellow; eyes prominent, pale yellow. Pronotum with dorsum convex in front and lightly sinuate posteriorly, apex deflexed; posterior process reaching tip of abdomen, lengthily deeply and broadly

compressed on each side from humeral angles halfway to apex; furnished with a strong percurrent median carina; a small tubercle and spot behind each eye, anterior border and a dot on each side just above it, a spot above each humeral angle, anterior two-thirds of lateral borders, and apex, yellow; elsewhere obscurely yellow mottled. Below, the chest and abdomen, femora except apices, black; apices of femora, and tibiae except apices sordid yellow; apices of tibiae, and the tarsi brown. Long. 5 mm.; lat. 2 mm.

*Habitat:* Pifo, Province of Pichincha, 2,588 meters, (Campos). Described from one female.

Differs from its congeners by the black color, yellow lateral borders, and strong percurrent carina. The apical fourth of the tegmina is wanting.

#### ECUATORIANA n. gen.

Ocelli equi-distant from the eyes and each other. Dorsum of pronotum moderately elevated, with numerous irregular longitudinal carinae, and bearing two large more or less quad-rangular elevations, the first just behind humeral angles, the second at middle; humeral angles developed into large flat auricular processes; posterior process covering clavus and a small part of corium. Tegmina with distinct veins; basal half of corium coriaceous and punctured, emitting three longitudinal veins equi-distant from each other and costa, space between interior ulnar vein and interior border occupying half its area, third apical cell triangular, petiolate, one discoidal cell. Wings with four apical cells, second subtriangular, petiolate, third long, broad, sessile. Tibiae not broadened; tarsi of equal length.

The venation is nearly identical with that of *Oxygonia chrysur* Fairm., while the general facies is that of a *Telemona*.

*Genotype:* *Ecuadoriana bactriana* n. sp.

#### *Ecuadoriana bactriana* n. sp.

Black, mottled with yellow, pronotum with numerous irregular longitudinal carinae and others passing to the superior border of dorsal elevations; median longitudinal carina strong, percurrent. Head triangular, apex lightly produced. Pronotum convex in front; dorsal elevations with superior borders lightly rounded, front and hind borders perpendicular the latter of the second elevation lightly sinuate; sinus between ele-

vations about equal in size to the second; apex reaching tips of tegmina; anterior third of lateral borders, a broad band behind second dorsal elevation and other irregular marks, yellow. Tegmina with basal half of corium black mottled with yellow, extremities including first four apical cells smoky, fifth cell large, subtriangular; discoidal cells long, very narrow, base formed by a transverse venule between ulnar veins before middle, apex suddenly enlarged and curved to reach fifth apical cell. Below black, tarsi pale. Long. 10 mm.; lat. inter hum. 6 mm.; altitude of elevations 5 mm.

*Habitat:* Zuñas, Province of Chimborazo, 2,000 meters, (Feyer). Described from one female.

**Tomogonia camposiana** n. sp.

Head entirely yellow, eyes prominent, pearly color. Front half of pronotum bright yellow except as follows: two spots above each eye, humeral horns, a broad stripe passing from humeral angles above lateral borders for one-third their length, a broad longitudinal median stripe originating some distance from base of pronotum, and posterior half of posterior pronotal process, shining black; lateral borders from humeral angles half way to apex broadly pale yellow; apex far surpassing tip of abdomen, but not quite reaching apices of tegmina. Tegmina transparent yellow, with a broad stripe extending from base to apex of corium, interior border of clavus, and nearly all of apical cells nearly black. Wings with four apical cells, second small, sessile, fourth very small. Body below yellow, sides of abdomen splashed with fuscous; ovipositor black; legs yellow, tips of posterior tibiae and of tarsi black. Long. 10 mm.; lat. inter hum. 5 mm.

*Habitat:* Posorja, Province of Guayas, (Campos). Described from three females. This species is nearest to *vittatipennis* Fairm., from Guatemala.

Named in honor of Prof. Francisco Campos R.

**Umbonia erecta** n. sp.

Very similar to *ataliba* Fairm., from which it differs in the median and lateral lines being black none of which pass to apex of dorsal horn which is reddish testaceous; the dorsal horn is long, very slender and erect and placed behind humeral angles. Tegmina pitchy at base, with all longitudinal veins piceous, cells transparent yellow, apex of corium darker. Femora and tibiae testaceous, the latter with a fuscous stripe. Otherwise as in *ataliba*. Long. 15 mm.; lat. inter hum. 8 mm.; alt. cornu. 7 mm.

*Habitat:* Rio Mangorisa, Province of El Oriente, (Feyer). Described from two slightly mutilated females.

**Membracis jessica** n. sp.

Nearly identical in form and size with *foliata*, from which it differs in being yellow with a broad vertical band extending from lateral angles to middle of dorsum, and a large quadrangular spot before apex of posterior process, sooty black. Long. 15 mm.; alt. 8 mm.

*Habitat:* Canelos, Lliquino, and Yaruquies, Province of El Oriente, (Feyer). Described from four females.

Dedicated to the memory of my wife, one of the victims of yellow fever.

**GUAYAQUILA** n. gen.

Pronotum armed with a compressed porrect horn in front, destitute of lateral carinae but with a percurrent median carina; dorsum flat, broad at humeral angles, gradually attenuated to an obtuse apex which reaches tip of abdomen, but shorter than apices of tegmina. Generally golden silky pubescent. Tegmina similar in shape and venation to those seen in the genus *Membracis*. Wings with four apical cells, second broad and quadrangular, fourth minute. Front and middle tibiae broadly dilated, short; posterior legs three times the length of front legs, hind tibiae with strong sharp spines. Facies of *Aconophora*.

*Genotype:* *Guayaquila roreriana* n. sp.

**Guayaquila roreriana** n. sp.

Uniform cinnamon brown, silky pubescent. Front horn with a compressed broad edge, not pointed but rounded at apex, convex between superior and inferior borders longitudinally, with a median longitudinal carina, but destitute of lateral carinae. Tegmina semi-opaque uniform brown. Body below brown, posterior edges of abdominal segments and anal segment paler. Tibiae testaceous, spines of hind tibiae black. Long 9 mm.; lat. 3 mm.

*Habitat:* Machala, Province of El Oro, (Rorer). Described from one male of which the head is wanting.

This species is named in honor of Prof. J. B. Rorer.

I desire to express my gratitude to Professors Campos, Rorer and Pachano, and Messrs. Goodfellow and Feyer for a multitude of favors in my endeavor to make the entomology of Ecuador better known.

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## Thermotropism in Insects.

By WERNER MARCHAND, New York City.

While the phenomena of helio- and phototropism have been extensively studied, concerning thermotropic reactions we have practically no data. The consequences of uneven